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No. 99-

IN THE

Supreme Court of the United States

FRANK MANCHAK, JR.,

Petitioner,

v.

SEVENSON ENVIRONMENTAL SERVICES, INC.,

Respondent.

ON PETITION FOR A WRIT OF CERTIORARI
TO THE UNITED STATES FEDERAL CIRCUIT COURT OF APPEALS

PETITION FOR A WRIT OF CERTIORARI

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QUESTION PRESENTED FOR REVIEW

What is the appropriate scope of review when the United States Court of Appeals for the Federal Circuit reviews patent claim construction decisions made by a United States District Court Judge?

PARTIES TO THE PROCEEDING

The petitioner is Frank Manchak, Jr.

The respondent is Sevenson Environmental Services, Inc.

Defendants in the underlying lawsuit in the United States District Court for the District of Delaware are Chemical Waste Management, Inc.; Rust Remedial Services, Inc.; Wheelabrator Environmental Services Inc.; and Laidlaw Environmental Services, Inc. Judge Roderick R. McKelvie of the District of Delaware stayed further action against these Defendants and allowed Petitioner to proceed only against Respondent. Defendants were not parties to the judgment and orders of the United States Court of Appeals for the Federal Circuit which form the basis of this petition. Petitioner will serve copies of the petition upon these Defendants.

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Frank Manchak, Jr. ("Manchak") petitions for a writ of certiorari to review the judgment of the United States Court of Appeals for the Federal Circuit in this matter.

OPINIONS BELOW

The Federal Circuit's order reversing the United States District Court for the District of Delaware, for which review is sought, is reproduced in Appendix A. The judgment of the District of Delaware, which the Federal Circuit reversed, is reproduced in Appendix B. The Federal Circuit's order denying a rehearing is reproduced in Appendix C. The judgment and orders are not reported.

STATEMENT OF JURISDICTION

On December 6, 1999, the Federal Circuit entered its order reversing the District Court's judgment. App. A. By order entered February 8, 2000, the Federal Circuit denied Manchak's Petition for Rehearing and Petition for Rehearing En Banc. App. C. This petition is filed within ninety days of entry of the February 8, 2000 order. This Court has jurisdiction under 28 U.S.C. § 1254(1).

CONSTITUTIONAL AND STATUTORY PROVISIONS INVOLVED

The relevant provisions are reproduced in the appendix to this petition. App. D.

STATEMENT OF THE CASE

Petitioner Manchak, a resident of Santa Barbara, California, is the inventor and owner of U.S. Patent No.

4,079,003 ("the '003 patent"), entitled "Method of Transforming Sludge into Ecologically Acceptable Solid Material," which issued on March 14, 1978. The preamble in claim 1 of the '003 patent states that its basic purpose concerns:

> [a] method of transforming aqueous organic material containing sludge that may include virus and odor forming bacteria and toxic soluble compounds that are converted to substantially insoluble compounds in an alkaline environment into a solid, friable, and substantially odor free reaction product. . . .

App. E.

At trial, Manchak testified about what his patent accomplished:

> [T]his patent basically . . . opened up a totally new industry. . . . [I]t was — able to, in a very basic form, . . . to deal with bacteria, deal with metals, deal with reduction. . . . These are all the things that people were interested in and it was of real importance. The most important thing that I had seen [was] that . . . the alternative costs were one of putting it into incinerators and burning the material or dumping it into the oceans or whatever, that this, in fact, provided a cost-effective way and a cheap way of dealing with some very, very serious problems.

Testimony of Frank Manchak, Jr., Tr. of Trial Proceedings pp. 152-53 (June 9, 1997).

On November 16, 1995, Manchak filed suit in federal court in Wilmington, Delaware against Sevenson Environmental Services, Inc. ("Respondent") and several others alleging infringement of the '003 patent. Manchak alleged that Respondent infringed the '003 patent during its clean-up of the Marathon Battery site, a Superfund site located in Cold Spring, New York. The trial court permitted the case against Respondent to go forward and stayed discovery and trial against all other defendants.

Respondent disputed the meaning of twenty-five words and phrases in claims 1 and 13 of the '003 patent. From January 14-16, 1997, United States District Judge Roderick R. McKelvie held a *Markman* trial to resolve those claim construction disputes. At the *Markman* trial, Judge McKelvie received the intrinsic evidence (the patent and the prosecution history) generally without objection. The three-day *Markman* trial then focused primarily on presentation of extrinsic evidence. Judge McKelvie received extensive testimony from Respondent's technical expert, Dr. G. Lee Christensen (Professor of Environmental Engineering, Villanova University), and Manchak's technical expert, Dr. Ronald D. Neufeld (Professor of Civil Engineering, University of Pittsburgh).

During the *Markman* trial, the crucial and contested question concerned the meaning of the disputed terms in claims 1 and 13 of the '003 patent as construed by a "person of ordinary skill in the art" at the time of the invention in 1976. Accordingly, Judge McKelvie heard expert testimony regarding the appropriate education and experience of a "person of ordinary skill in the art" in 1976. The experts hotly contested those qualifications. Dr. Christensen testified that a person of ordinary skill in the art would have had a

master's degree in environmental engineering and five years of experience in sludge treatment. Dr. Neufeld disagreed and testified that such a person would have been a project manager in environmental remediation without any formal education beyond high school. Dr. Neufeld based those qualifications on the low education level among workers in the environmental remediation industry in 1976 and slow technological advances in the field at that time.

Judge McKelvie received the testimony and resolved the issues as any trial court does — by evaluating the evidence and its credibility. The court explained:

> After evaluating the testimonies of Drs. Christensen and Neufeld, the court finds that Dr. Neufeld's definition of one with ordinary skill in the art of sludge treatment in 1976 is more appropriate. . . .
>
> * * *
>
> Accordingly, the court will adopt the following definition of one with ordinary skill in the art of sludge treatment in 1976:
>
> > A sludge removal project supervisor, who has worked at least two years in the industry and remains continually abreast of practical innovations and technological developments in the art of sludge treatment.
>
> Having set out the level of ordinary skill in the art of sludge treatment in 1976, the court will now

> endeavor to construe the genuinely disputed terms of claims 1 and 13 of the '003 patent.

App. B at 34a.

Judge McKelvie followed the same approach in construing each of the twenty-five disputed terms. He received pre-trial briefs, listened to three days of testimony from the technical experts and others, received documentary evidence, and heard oral argument.

On May 1, 1997, Judge McKelvie issued a thirty-four page opinion resolving the claim construction issues in advance of trial. From June 9-19, 1997, the case was tried to a jury. The jury found that Respondent literally infringed the '003 patent and awarded Manchak $975,000 in damages.

Following post-trial motions, Respondent appealed the judgment to the Federal Circuit. On December 6, 1999, the Federal Circuit reversed the trial court and entered judgment for Respondent. The reversal focused entirely on claim construction. The Federal Circuit applied a de novo standard of review without any deference to the trial court's decision. The Federal Circuit singled out two of the twenty-five words that the trial court laboriously construed and substituted its own determination of what it believed those words meant. The Federal Circuit then held that, under its own construction of the terms, no infringement occurred. The Federal Circuit explained its actions by asserting that:

> A district court's construction of disputed claim terms is a question of law subject to plenary review on appeal. *See Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1456, 46 USPQ2d 1169, 1174

> (Fed. Cir. 1998) (en banc). This court owes no deference to a jury verdict based on an improper claim construction, especially where the correct construction of the claims is dispositive on the issue of infringement.

App. A at 6a-7a.

In its written opinion, the Federal Circuit neither reviewed the testimony from the three-day *Markman* trial nor discussed the education and/or experience level of a "person of ordinary skill in the art." Rather, the Federal Circuit appears to construe the claim terms based on the skill and experience of the members of that court, and not based on the understanding of a person of ordinary skill in the art in 1976.

REASONS FOR GRANTING THE WRIT

The Federal Circuit's de novo review of patent claim construction decisions made by federal district court judges in *Markman* hearings is inconsistent with Supreme Court precedent, the Federal Rules of Civil Procedure, the appropriate allocation of judicial resources, and fundamental fairness.

In an en banc decision in *Cybor Corp. v. FAS Technologies., Inc.*, 138 F.3d 1448 (1998), which yielded six separate opinions, the Federal Circuit held that it would apply a de novo standard of review to *Markman* hearings and claim construction. *See id.* at 1456. Applying that standard in this case, the Federal Circuit gave no deference whatsoever to the decision of the trial judge. That was the trial judge who held three days of hearings, listened to the

witnesses, reviewed the documents, asked questions of the witnesses and the lawyers, and read the briefs. It was the same trial judge who then wrote a thirty-four page decision that first determined the education and experience of a person of ordinary skill in the art before deciding how that person would interpret the twenty-five disputed words and phrases in the patent. The Federal Circuit, under its de novo standard, instead ignored the trial court's decision, and substituted its own construction for that of a person of ordinary skill in the art of sludge removal in 1976.

The question before this Court is simple: When the Federal Circuit reviews claim construction decisions made by a federal district court judge, is the scope of review de novo or does the Federal Circuit owe some level of deference to the action of the trial judge? The Federal Circuit says it owes no deference. This Court has never decided the issue.

I. The Historical Uncertainty and Need for Resolution.

Determination of the proper scope of review by an appellate court of trial court orders depends upon whether the underlying issue is (1) a question of law (de novo review), (2) a question of fact (deferential review, usually "clearly erroneous"), or (3) a mixed question of law and fact. Considerable doubt, however, has existed for years regarding the Federal Circuit's scope of review for claim construction decisions in patent cases because this Court has never addressed the question.

The intellectual property world has questioned for some time whether patent claim construction is a question of law exclusively for the court, a question of fact for the trier of fact (judge or jury), or a mixed question of fact and law. In

Markman v. Westview Instruments, 52 F.3d 967 (Fed. Cir. 1995) (en banc) ("*Markman I*"), the Federal Circuit held that claim construction is a question of law exclusively for the court. This Court affirmed in *Markman v. Westview Instruments*, 517 U.S. 370 (1996) ("*Markman II*"), finding no historical right to a jury trial for claim construction. *See id.* at 372 ("We hold that the construction of a patent, including terms of art within its claim, is exclusively within the province of the court.").

This Court's decision that claim construction is "exclusively within the province of the court," however, does not determine whether claim construction is a legal question or a factual question. That issue simply was not before the *Markman II* Court, which held only that there is no right to a jury trial for claim construction.

The *Markman II* Court, however, gave some guidance on the issue. It stated that "construing a term of art following receipt of evidence" is a "mongrel practice" and that the issue may "fall[ ] somewhere between a pristine legal statement and a simple historical fact." 517 U.S. at 378, 388. Nevertheless, a majority of the Federal Circuit in *Cybor* held that claim construction is a legal issue that requires de novo review without deference to the trial court. The *Cybor* decision, however, severely divided the Federal Circuit, yielding six separate opinions, including two separate dissenting opinions specifically addressing the scope of review issue.

Since *Markman I* and *II* (and *Cybor*), trial court claim construction has followed a consistent pattern. If genuinely disputed patent terms arise, the trial court holds a *Markman* hearing. Hearings may last a few hours or several days.

Several courts have specific written rules governing claim construction trials. *See, e.g.*, N. Dist. Cal. Loc. R. 16-10 to 11 (addressing procedures for claim construction proceedings and hearing). Pretrial briefs generally precede the hearings, followed by opening statements, witnesses, offers of evidence, arguments, objections and the full panoply of trial procedures. Thereafter, the trial judge renders a decision. Clearly, the *Markman* trial mirrors a bench trial in form and substance.

This case provides no exception. The procedures here required pretrial briefs, opening statements, and three days of trial testimony. The hearings focused primarily on opposing technical experts explaining the characteristics they believed a person of ordinary skill in the appropriate art would have had at the relevant time and how that person would interpret the disputed terms. Thereafter, Judge McKelvie construed the claims and issued a thirty-four page opinion.

As with prior patent cases, the Federal Circuit relied on the majority decision in *Cybor* to engage in a de novo review of the trial court's claim construction process. Here, the Federal Circuit accordingly determined that it could ignore the trial testimony and lower court's decisions. That approach, however, neither gained the approval of the dissenting judges in *Cybor* who opposed this unilateral assumption of power, nor has it settled well with the intellectual property bar. *See* Luke L. Dauchot, "The Federal Circuit's De Novo Review of Patent Claim Construction: A Need for a More Balanced Approach," *IPL Newsletter* (Amer. Bar Ass'n), Fall 1999, at 1, *reprinted in* App. L.

Further, federal district court judges are equally mystified by the Federal Circuit's de novo approach, which ignores and effectively nullifies the *Markman* trials they hold:

> This somewhat startling conclusion that the trial judge "does not make credibility assessments" apparently derives from the en banc court's more general holding that no issue of claim construction presents a question of fact for the jury. As I understand *Markman*, because claim construction presents a purely legal question, trial judges must ignore all non-transcribible [sic] courtroom occurrences such as a witness' body language, inability to maintain eye contact when confronted with a telling question, hesitance or delay in giving an answer, an affirmative answer in a voice revealing the truthful answer is "no," or the changing demeanor of a witness when shifting from sure to treacherous footing. All of the preceding occurred in this trial. When two experts testify differently as to the meaning of a technical term, and the court embraces the view of one, the other, or neither while construing a patent claim as a matter of law, the court has engaged in weighing evidence and making credibility determinations. If those possessed of a higher commission wish to rely on a cold written record and engage in de novo review of all claim constructions, that is their privilege. But when the Federal Court of Appeals states that the trial court does not do something that the trial court does

> and must do to perform the judicial function, the court knowingly enters a land of sophistry and fiction.

Lucas Aerospace v. Unison, 890 F. Supp. 329, 333 n.7 (D. Del. 1995).

In light of this situation, now is the proper time for the Supreme Court to answer the important question: What is the appropriate scope of review for patent claim construction?

II. The Federal Circuit's De Novo Review of the Trial Court's Factual Decisions is Contrary to Supreme Court Precedent, the Federal Rules of Civil Procedure, Proper Concepts of Judicial Allocation, and Fundamental Fairness.

A. The Supreme Court Rule for Appellate Review of Factual Decisions of a Trial Court Requires Application of a "Clearly Erroneous" Standard.

Supreme Court precedent makes it clear that the standard of review for factual decisions made by the trial judge is a "clearly erroneous" standard. The Court has stated that:

> Although the meaning of the phrase "clearly erroneous" is not immediately apparent, certain general principles governing the exercise of the appellate court's power to overturn findings of a district court may be derived from our cases. The foremost of these principles, as the Fourth Circuit itself recognized, is that "[a] finding is 'clearly erroneous' when although there is evidence to support it, the reviewing court on the entire

> evidence is left with the definite and firm conviction that a mistake has been committed." *United States v. United States Gypsum Co.*, 333 U.S. 364, 395 (1948). This standard plainly does not entitle a reviewing court to reverse the finding of the trier of fact simply because it is convinced that it would have decided the case differently. The reviewing court oversteps the bounds of its duty under Rule 52(a) if it undertakes to duplicate the role of the lower court. "In applying the clearly erroneous standard to the findings of a district court sitting without a jury, appellate courts must constantly have in mind that their function is not to decide factual issues de novo." *Zenith Radio Corp. v. Hazeltine Research, Inc.*, 395 U.S. 100, 123 (1969). If the district court's account of the evidence is plausible in light of the record viewed in its entirety, the court of appeals may not reverse it even though convinced that had it been sitting as the trier of fact, it would have weighed the evidence differently. Where there are two permissible views of the evidence, the factfinder's choice between them cannot be clearly erroneous. *United States v. Yellow Cab Co.*, 338 U.S. 338, 342 (1949); *see also Inwood Laboratories, Inc. v. Ives Laboratories, Inc.*, 456 U.S. 844 (1982).

Anderson v. Bessemer City, 470 U.S. 564, 573-74 (1984).

Justice White spoke for the *Anderson* Court when he stated that not only does the "clearly erroneous" standard apply when the decisions of the trial court are based on witness credibility judgments, but it also applies with equal force to decisions based on documentary and other types of evidence. *See id.* at 573-74. Justice White explained that:

> The rationale for deference to the original finder of fact is not limited to the superiority of the trial judge's position to make determinations of credibility. The trial judge's major role is the determination of fact, and with experience in fulfilling that role comes expertise. Duplication of the trial judge's efforts in the court of appeals would very likely contribute only negligibly to the accuracy of fact determination at a huge cost in diversion of judicial resources. In addition, the parties to a case on appeal have already been forced to concentrate their energies and resources on persuading the trial judge that their account of the facts is the correct one; requiring them to persuade three more judges at the appellate level is requiring too much. As the Court has stated in a different context, the trial on the merits should be "the 'main event' . . . rather than a 'tryout on the road.' " *Wainwright v. Sykes*, 433 U.S. 72, 90 (1977). For these reasons, review of factual findings under the clearly-erroneous standard — with its deference to the trier of fact — is the rule, not the exception.

Id. at 574-75. This same rationale should apply to the decisions of federal district court judges made after they hold *Markman* hearings, observe witnesses, and review documents and other evidence.

B. The Federal Rules of Civil Procedure Require Application of a "Clearly Erroneous" Standard to a Judge's Factual Decisions.

In 1984, when this Court decided *Anderson*, Federal Rule of Civil Procedure 52 stated that "[f]indings of fact shall not be set aside unless clearly erroneous, and due regard shall be given to the opportunity for the trial court to judge of [sic] the credibility of the witness." In 1985, Rule 52 was amended to add language clarifying that it applies to judicial decisions based on documents as well as witness testimony. The Advisory Committee explained the reason for the change, stating:

> The principal argument advanced in favor of a more searching appellate review of findings by the district court based solely on documentary evidence is that the rationale of Rule 52(a) does not apply when the findings do not rest on the trial court's assessment of credibility of the witnesses but on an evaluation of documentary proof and the drawing of inferences from it, thus eliminating the need for any special deference to the trial court's findings. These considerations are outweighed by the public interest in the stability and judicial economy that would be promoted by recognizing that the trial court, not the appellate tribunal, should be the finder of the facts. *To permit courts of appeals to share more actively in the fact-finding function would tend to undermine the legitimacy of the district courts in the eyes of litigants, multiply appeals by encouraging appellate retrial of some factual issues, and needlessly reallocate judicial authority.*

Fed. R. Civ. P. 52 advisory committee's note (emphasis added). The same public interest in the stability of and confidence in the judicial system strongly militates in favor of deference to trial court decisions.

Further, application of Rule 52 is imperative in patent cases in which the trial judge must review technical evidence and expert testimony to reach a decision. In *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 336 U.S. 271 (1949), this Court applied Rule 52 in a patent infringement case and required the appellate court to defer to the "advantages possessed by the trial court in appraising the significance of conflicting testimony and reverse only 'clearly erroneous' findings." *Id.* at 275. Noting that the trial judge had reviewed the evidence and expert testimony at length, the Court clearly stated that "to no type of case is this last clause [of Rule 52(a)] more appropriately applicable than to the one before us, where the evidence is largely the testimony of experts as to which a trial court may be enlightened by scientific demonstrations." *Id.*; *see also Dennison Mfg. Co. v. Panduit Corp.*, 475 U.S. 809 (1986) (per curiam) (holding that regardless of whether "obviousness" is an issue of fact subject to Rule 52, the "subsidiary determinations of the District Court, at least, ought to be subject to the Rule.").

C. Patent Claim Construction is a Mixed Question of Fact and Law for Which the Trial Judge is the Proper Judicial Actor to Decide the Issue.

Both *Anderson* and Rule 52 address the scope of review for "fact" issues. Once a court characterizes an issue as a "fact" question or a "legal" question, the rules for the scope of appellate review become clear. The difficult question, however, is properly characterizing an issue as one of fact,

one of law, or a mixed question of fact and law. No fail-safe litmus test exists to provide an easy answer.

In *Miller v. Fenton*, 474 U.S. 104 (1985), this Court reviewed the question of whether the "voluntariness" of a confession is a question of fact or law. The Court stated that "the appropriate methodology for distinguishing questions of fact from questions of law has been, to say the least, elusive." *Id.* at 113. The Court went on to say:

> Perhaps much of the difficulty in this area stems from the practical truth that the decision to label an issue a "question of law," a "question of fact," or a "mixed question of law and fact" is sometimes as much a matter of allocation as it is of analysis. At least in those instances in which Congress has not spoken and in which the issue falls somewhere between a pristine legal standard and a simple historical fact, the fact/law distinction at times has turned on a determination that, as a matter of the sound administration of justice, one judicial actor is better positioned than another to decide the issue in question.

Id. at 113-14 (citation omitted).

As this Court suggested in *Markman II*, the practice of patent claim construction is a mixed question of fact and law, such that it is appropriate to analyze who is the better judicial actor to decide the question. 517 U.S. at 378, 388. As between a trial judge, who presides over the entire claim construction process, hears the witnesses' testimony, and has intimate involvement with the details, and appellate judges, who review briefs and hear argument on carefully selected

issues, the choice is clear. Judge Rader expressed this cogently in his *Cybor* dissent, stating:

> [A] sterile written record can never convey all the nuances and intangibles of the decisional process. Indeed a careful consideration of the institutional advantages of the district court would counsel deference. This court's categorical response that claim interpretation involves no factual assessments does not advance a functional analysis of trial and appellate roles in claim construction. As a matter of fact (so to speak), claim construction requires assessment of custom and usage in the relevant art, assessment of events during prosecution, assessment of the level of ordinary skill in the art, assessment of the understanding of skilled artisans at the time of invention — to name just a few factual components of the complex process of claim interpretation. A careful functional analysis counsels deference for district court claim interpretations.

Cybor, 138 F.3d at 1478 (Rader, J., dissenting).

The claim construction process requires the judge to decide what specific words mean to a person of ordinary skill in the art at the time of invention. Some words may be extremely technical, while others may be expressed in simple English but used in combination with other technical words. The judge may hear witnesses and receive evidence to "construct" the knowledge and experience that a person of ordinary skill in the art had at the appropriate time. The trial judge then must decide what the disputed words would mean

to such a theoretical person. This process frequently requires hearing technical witnesses in the art and then making credibility decisions regarding the specific positions. The judge finally must make a decision regarding interpretation of the patent. These functions are traditional duties within the fundamental province of a trial judge — to receive pre- and/or post-*Markman* trial briefs; view, hear and evaluate witnesses; receive documentary evidence; listen to oral argument; and evaluate all of this to reach a decision. This process is precisely what trial judges are trained — and best suited —to do.

D. Fundamental Fairness Dictates that De Novo Review by the Federal Circuit of the Trial Court's *Markman* Decision is Wrong.

A sense of fairness is imperative to the American judicial system. A patent litigant loses this sense under the Federal Circuit's current de novo standard. In cases such as this one, a litigant participates in a *Markman* trial. After this lengthy, expensive procedure, however, federal appellate judges who have never seen the witnesses or heard the evidence can simply ignore and nullify the results without the slightest deference to the trial court's decision. The trial court's process becomes meaningless and its decisions have no value despite the trial judge's proximity to and involvement with the evidence supporting claim construction. The words of the Advisory Committee when it amended Rule 52 in 1985 spoke to this issue of fundamental fairness. *See* Fed. R. Civ. P. 52 advisory committee's note.

This Court addressed the same concept of fundamental fairness in *Anderson*, when it held that "the trial on the merits should be 'the 'main event' . . . rather than a 'tryout on the

road.' ' " 470 U.S. at 575 (citing *Wainwright v. Sykes*, 433 U.S. 72, 90 (1977)) (noting that, after litigants have expended energy to persuade a trial judge of their cause, "requiring them to persuade three more judges at the appellate level is requiring too much"). The Court therefore endorsed the "clearly erroneous" standard for review of fact questions. *See id.*; *see also Dennison Mfg. Co.*, 475 U.S. at 810 (holding that clearly erroneous standard should apply to subsidiary factual issues of ultimate issue).

The specialized appellate judges of the Federal Circuit unilaterally have usurped the trial court's role by implementing a de novo review standard and disregarding the work of the generalist federal district court judges. The words of Judge Mayer in his separate opinion in *Markman I* are worthy of consideration: "The quest to free patent litigation from the 'unpredictability' of jury verdicts, and generalist judges, results from insular dogmatism inspired by unwarrantable elitism; it is unconstitutional." *Markman I*, 52 F.3d at 989.

Indeed, in this pursuit, the Federal Circuit has been inconsistent in its determination whether or not review and analysis of patent terms results in a question of fact or a question of law. In *Cybor*, the Federal Circuit concluded that the district court's analysis of a patent and determination of the meaning of disputed claim terms presented a question of law, and therefore was subject to de novo review. Yet, in *In re Zurko*, 111 F.3d 887 (Fed. Cir. 1997), *rev'd*, 527 U.S. 150 (1999), the Federal Circuit concluded that the same type of analysis and determination by a patent examiner regarding an obviousness finding was a question of fact subject to review under a "clearly erroneous" standard. *See id.* at 889 ("We review the ultimate determination of obviousness

de novo and the underlying factual determinations for clear error. . . . We agree with applicants that the Board's finding that the prior art teaches, either explicitly or inherently, the step of obtaining confirmation over a trusted pathway is clearly erroneous.").

In each instance, the Federal Circuit followed an approach designed to give it greater review power than that exercised by the other federal appellate courts. In *Zurko*, application of the clearly erroneous standard meant less deference to the agency decision than federal appellate courts are required to give under the "arbitrary and capricious standard" of the Administrative Procedure Act. Likewise, in *Cybor*, the Federal Circuit's conclusion that the district court's claim construction was a question of law subject to de novo review resulted in the Federal Circuit obtaining the broadest possible scope of review. To reach this result, the Federal Circuit labels "legal conclusions" in *Cybor* what it called "factual conclusions" in *Zurko*, in order to serve its own interest in expanding its power. Such inconsistent, self-enhanced appellate authority is inimical to the fair administration of justice and should not be countenanced. This inconsistency further supports the Supreme Court's conclusion in *Markman II* that claim construction actually is a mixed question of fact and law. It demonstrates that the relevant question focuses on which judicial actor is best positioned to resolve the issue.

Other federal appellate judges of the various circuits exercise restraint because other federal circuits may review similar issues. For example, the Sixth Circuit understands that each and every other federal circuit likely may decide substantially similar issues as the Sixth Circuit. This understanding serves to check and balance any single federal

appellate court from overreaching its authority. No similar restraint exists for the Federal Circuit in patent cases. Once the Federal Circuit usurps traditional trial judge duties for patent claim construction by labeling them "questions of law" subject to a de novo review standard, litigants have no where to turn but the Supreme Court of the United States.

III. The Questions Presented Are Important.

The appropriate standard of review is an important issue that remains a topic of substantial disagreement to the intellectual property bench and bar. The Federal Circuit Judges remain divided, as demonstrated by the six separate opinions in *Cybor*. The intensity of the schism is clear from Judge Rader's dissenting opinion in *Cybor*:

> As a matter of legal analysis, the en banc court's direction to trial judges is equally hard to justify. The objective of claim interpretation is to discern the meaning of the claim terms to one of ordinary skill in the art at the time of invention. . . . In effect, the en banc opinion has *sub silentio* redefined the claim construction inquiry as "how a lawyer or judge would interpret the term."

Cybor, 138 F.2d at 1475 (citation omitted).

In addition to dividing the appellate bench, the de novo standard has left the intellectual property bar at a loss. As one commentator states:

> The question of appellate deference to the claim construction process at the trial level long has been a source of deep division within the Court

> of Appeals for the Federal Circuit (CAFC). At the root of the division lie two competing interests: consistency and certainty in the interpretation of patents, on the one hand, and the primacy of trial courts in resolving factual disputes, on the other.
>
> * * *
>
> Stripped of their traditional fact-finding authority, trial courts now find themselves as appellate court adjuncts — developing a factual record that the CAFC often needs but cannot, as a court of review, create. Moreover, hostage to fact-specific cases and the fiction that there is no fact-finding in claim interpretation, the appellate directives on the permissible use and bounds of extrinsic evidence rightly can be described as a Tower of Babel.

Dauchot, App. L at 1, 4. The de novo standard has equally mystified federal district court judges inasmuch as it ignores and nullifies *Markman* trials. *See supra* pp. 10-11 (quoting *Lucas Aerospace*, 890 F. Supp at 333 n.7).

Further, the de novo standard that the Federal Circuit has adopted for itself has resulted in a high reversal rate. That reversal rate breeds uncertainty and protracted litigation, which significantly detract from any sense of fairness in the judicial process. As Judge Rader has explained:

> Several high profile appeals have illustrated the problem created by the Federal Circuit's high reversal rate. In *Lubrizol*, 64 F.3d 1553, and *J.T.*

> *Eaton & Co. v. Atlantic Paste & Glue Co.*, 106 F.3d 1563, 41 U.S.P.Q.2D (BNA) 1641 (Fed. Cir. 1997), this appellate court rejected not only the trial judge's claim reading, but also the readings advocated by both parties at trial and the readings advocated by all experts in the trial. In fact, in *Eaton*, the Federal Circuit did not base its interpretation on the specification or the totality of the prosecution history, but instead found its meaning in a brief excerpt from the affidavit of a single expert witness at the end of a lengthy prosecution. If the parties might succeed in convincing the Federal Circuit to reverse an entire trial result with an argument never presented to the trial court or with a brief excerpt from hundreds of pages of prosecution (again not presented to the trial court), would they be wise to settle after a trial court's reading of the claims?

Cybor, 138 F.3d at 1476 (Rader, J., dissenting) (citation omitted).

Finally, in addition to the bench and bar being troubled by the de novo review standard, the inventors supposedly protected by the patent laws have been thrown into confusion. On the one hand, the Constitution promotes invention. *See* U.S. Const. art. I, § 8, cl. 8 ("The Congress shall have Power . . . to promote The Progress of Science and the Useful Arts, by securing for limited times to Authors and Inventors the exclusive Rights to Their Respective Writings and Discoveries. . . ."). On the other hand, patent infringement plaintiffs must pay a heavy price for such Constitutional "protection" by financing multiple trials to secure their inventions — a *Markman* trial for claim construction and a

jury trial for infringement. Permitting de novo review of claim construction simply stifles the inventive process if a plaintiff finds that, after financing a *Markman* trial before a district judge and paying experts to testify, the Federal Circuit can merely brush aside that court's work and its deliberative process.

CONCLUSION

For the reasons stated above, the petition for a writ of certiorari to the United States Court of Appeals for the Federal Circuit should be granted.

Respectfully submitted,

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APPENDIX

APPENDIX A — OPINION OF THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT DATED AND DECIDED DECEMBER 6, 1999

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

98-1530

FRANK MANCHAK, JR.

Plaintiff-Appellee,

v.

CHEMICAL WASTE MANAGEMENT, INC., RUST REMEDIAL SERVICES, INC., WHEELABRATOR ENVIRONMENTAL SYSTEMS, INC., AND LAIDLAW ENVIRONMENTAL SERVICES, INC.,

Defendants,

and

SEVENSON ENVIRONMENTAL SERVICES, INC.,

Defendant-Appellant.

Decided: December 6, 1999

Before MAYER, *Chief Judge*, MICHEL and CLEVENGER, *Circuit Judges*.

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MICHEL, *Circuit Judge*.

Sevenson Environmental Services, Inc. ("Sevenson") appeals from the judgment of the United States District Court for the District of Delaware entering a jury verdict that Sevenson literally infringed claims 1 and 2 of Frank Manchak, Jr.'s U.S. Patent No. 4,079,003 ("the '003 patent"). Sevenson also appeals the district court's alternative post-trial finding under Rule 49(a) of the Federal Rules of Civil Procedure that Sevenson infringed claims 1 and 2 under the doctrine of equivalents and the district court's award of damages and attorney fees to Manchak. Because the district court erred in its claim construction and thereby improperly found both literal and equivalent infringement, we *reverse* the judgment of the district court in all respects.

I.

Manchak is the named inventor and owner of the '003 patent, entitled "Method of Transforming Sludge into Ecologically Acceptable Solid Material." Claims 1 and 2 recite a method for treating sludge with calcium oxide (commonly known as limestone or "quick lime"):

> 1. A method of transforming aqueous organic material containing sludge that may include virus and odor forming bacteria and toxic soluble compounds that are converted to substantially insoluble compounds in an alkaline environment into a solid, friable, and substantially odor free reaction product, said method comprising the steps of:

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a. sequentially moving said sludge from a source thereof at a first rate;

b. sequentially moving calcium oxide from a source thereof at a second rate, with said second rate so related to said first rate that when sludge and calcium oxide are mixed an exothermic reaction is initiated in which said sludge and calcium oxide react with the evolution of steam to form a solid, friable, substantially odor free reaction product that has a pH of at least 12 and in which bacteria and virus initially present in said sludge are deactivated by said pH and the heat of said exothermic reaction, and said soluble toxic compounds initially present in said sludge are transformed to substantially water insoluble compounds due to the high pH of the mixture of said sludge and calcium oxide as they transform to said reaction product;

c. providing an *elongate confined space* that has first and second ends;

d. directing said sludge and calcium oxide at said first and second rates into said first end of said confined space;

e. concurrently mixing and moving the mixture of said sludge and calcium oxide in said confined space from said first end

towards said second end thereof, with the rate of longitudinal movement of said mixture in said confined space being such that said exothermic reaction has transformed said mixture to said reaction product by the time said reaction product has reached said second end;

f. *withdrawing said steam from said confined space*; and

g. sequentially removing said reaction product from said second end of said confined space.

2. A method as defined in claim 1 in which said mixture is concurrently mixed and moved longitudinally in said confined space by rotating a number of longitudinally spaced, transversely and angularly disposed rigid surfaces within the confines of said confined space.

(Emphasis added.)

Briefly summarized, sludge and calcium oxide simultaneously enter one end of an apparatus through two different openings and at two different rates. They are then mixed in the "confined space" of the apparatus to initiate an exothermic reaction. The reaction product exits the apparatus through a third opening at the opposite end, and the steam created by the reaction is withdrawn from the apparatus.

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Sevenson, an environmental remediation firm, used the "Maectite process" in cleaning up the Marathon Battery Site in upstate New York. In the Maectite process, sludge is poured into a hopper covered by a screen to keep out branches and rocks. The hopper funnels the sludge onto a conveyor belt that in turn leads to a weigh belt. The weigh belt weighs the sludge and then dumps it into a second hopper. Lime is then poured into the second hopper at a rate dependent upon the weight of the sludge. The second hopper leads to a final conveyor belt, which feeds the sludge into an enclosed box-like structure called a "pugmill." Inside the pugmill, a series of intertwined rotating paddles mix the sludge with the calcium oxide and advance the mixture towards an opening on the other end. Notably, the pugmill has a safety screen on top that allows the steam formed by the exothermic reaction to freely escape. The pugmill forces the mixture out the second end for transport away from the site by truck or railcar.

In November 1995, Manchak brought a patent infringement suit in the United States District Court for the District of Delaware against six defendants. When ordered to select one defendant, Manchak chose Sevenson. The district court issued its claim construction opinion on May 1, 1997. On June 19, 1997, a jury found that Sevenson had literally infringed '003 claims 1, 2, 13, and 14 and awarded damages of $975,000. Because it found literal infringement, the jury skipped the questions of infringement by equivalents as the district court had instructed.[1]

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1. The jury also found the '003 patent to be enforceable and not invalid, i.e., not anticipated, obvious, or not enabled. In January

(Cont'd)

After the verdict, Sevenson renewed its motion for judgment as a matter of law of no literal infringement. On February 26, 1998, the district court granted Sevenson's motion with respect to claims 13 and 14, but denied it with respect to claims 1 and 2. The district court also invoked Rule 50(b) of the Federal Rules of Civil Procedure to find, in the alternative, that Sevenson had infringed claims 1 and 2 under the doctrine of equivalents. On June 26, 1998, after realizing that Manchak had never actually moved post-trial for judgment of infringement as a matter of law, the district court re-labeled its finding of infringement by equivalents as arising under Rule 49(a). The district court also declared the case to be "exceptional," and awarded Manchak $18,990.55 in attorney fees. This court has jurisdiction over this appeal under 28 U.S.C. § 1295(a)(1) (1994).

II.

A district court's construction of disputed claim terms is a question of law subject to plenary review on appeal. *See Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1456, 46 USPQ2d 1169, 1174 (Fed. Cir. 1998) (*en banc*). This court owes no deference to a jury verdict based on an improper claim construction, especially where the correct construction

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(Cont'd)

1998, after the jury had reached its verdict but before the district court had ruled on the parties' post-trial motions, the Patent and Trademark Office ordered the reexamination of the '003 patent. On April 7, 1999, the examiner issued a Notice of Intent to Issue Reexamination Certificate, thereby confirming the patentability of the claimed invention. Sevenson does not appeal the jury's findings regarding enforceability or validity.

of the claims is dispositive on the issue of infringement. *See Strattec Security Corp. v. General Automotive Specialty Co.*, 126 F.3d 1411, 1419, 44 USPQ2d 1030, 1036 (Fed. Cir. 1997).

In its May 1, 1997 claim construction opinion, the district court construed the term "confined space" in claims 1 and 2 as:

> An elongate space that must confine the reaction product of calcium oxide and sludge. However, steam produced as a result of the reaction between calcium oxide and water in the sludge need not be so confined.

Sevenson contends that the district court erroneously construed "confined space" as only confining the reaction product of calcium oxide and sludge. Sevenson argues that the claims themselves, the written description, and the prosecution history establish that the "confined space" must confine steam. Because the pugmills that Sevenson used in its Maectite process indisputably lack a steam-confining top, Sevenson maintains that it cannot literally infringe upon claims 1 and 2 of the '003 patent. We agree.

The plain language of the claims themselves demonstrates that the "confined space" must also confine steam. Nothing in claim 1 suggests that "confined space" be narrowly construed as confining only reaction product of calcium oxide and sludge, but not steam. "Without an express intent to impart a novel meaning to claim terms, an inventor's claims take on their ordinary meaning." *York Prods., Inc. v.*

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Central Tractor Farm & Family Ctr., 99 F.3d 1568, 1572, 40 USPQ2d 1619, 1622 (Fed. Cir. 1996). The step of "withdrawing said steam from confined space" in claim 1 also would make little sense if the steam were not confined in the space to begin with.

The district court's definition of "confined space" further conflicts with claims 5 and 7, which recite:

> 5. The method as defined in claim 1 in which *said confined space* is of such depth that a *longitudinally extending space is provided in said confined space into which said steam can accumulate*, and said longitudinally extending confined space in communication with *a passage through which said steam may flow to the exterior of said confined space*.
>
> 6. The method as defined in claim 5 which includes the further step of:
>
> h. *blowing a stream of air* across said passage and substantially normal thereto *to withdraw said steam* from said longitudinally extending space.
>
> 7. The method as defined in claim 6 which includes the further step of:
>
> i. directing the mixture of air and steam through a spray of water to remove foreign particled material from said steam prior to

> said air and *uncondensed steam being discharged* to the ambient atmosphere.

(Emphasis added.) Claim 5 requires that the "confined space" be of sufficient depth to allow steam to accumulate and provides a "passage" through which steam may "flow" to the exterior. These limitations presuppose a steam-confining top, but the only structure in claim 5 that can provide this top is the "elongate confined space" limitation of claim 1. Claim 5 does not otherwise add any new structure that would force steam to accumulate in, rather than passively rise out of, "said confined space." Claim 6 blows the steam out of the confined space via the passage provided in claim 5 to "withdraw" it. Claim 7 further recites the "discharge" of accumulated steam to the "ambient atmosphere" after washing away particulate matter with water. This limitation would also make little sense unless the "said confined space" of claim 1 already prevented the steam from entering the "ambient atmosphere."

The written description tends to confirm this interpretation. It mentions the term "confined" in only one other context, i.e., "sumps are covered with plastic sheet or other impervious sheet to *confine* the smell." '003 patent, col. 7, II. 36-37 (emphasis added). Since an inventor is presumed to have intended a consistent meaning for a term used in different portions of the written description, Manchak's illustration of a plastic sheet as "confining" gases implies that the "confined space" should also "confine" steam.

Finally, the prosecution history also tends to reinforce our interpretation of "confined space" as also confining

steam. During the prosecution of the '003 patent, the examiner cited U.S. Patent No. 3,476,873 to Liljegren ("the '873 patent"). The '873 patent teaches the treatment of sewage with lime involving the pre-treatment of the sewage in "one or more sedimentation and/or flotation pools." '873 patent, col. 2, II. 38-39. To distinguish claim 1 over the '873 patent, Manchak explained that "applicant requires no sedimentation and/or flotation pools" and, more significantly, advised that "[d]uring the reaction steam is formed *in* the confined space and removed therefrom." (Emphasis added.) Logically, steam cannot be "formed *in* the confined space" if the "confined space" does not also confine steam. Moreover, unless confined, steam would hardly need to be "removed therefrom."

The district court's unusual construction of "confined space" primarily resulted from its oversight of two sound principles of patent law. First, the district court held that independent claim 1 could not read on any process for allowing steam to accumulate in the elongate space, since the accumulation of steam in such space was a limitation appearing only in dependent claim 5. As this court has previously recognized, however, "[i]t is axiomatic that dependent claims cannot be found infringed unless the claims from which they depend have been found to have been infringed." *Wahpeton Canvas Co. v. Frontier, Inc.*, 870 F.2d 1546, 1553, 10 USPQ2d 1201, 1208 (Fed. Cir. 1989). The district court also improperly refused to consider the embodiment depicted in Figure 14 and described in columns 8 through 10 to aid its construction of "confined space," since it incorrectly assumed that the written description required more limitations than set forth in claim 1. The district court

seemingly ignored this court's repeated statement that "[c]laims must be read in view of the specification, of which they are a part." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976, 34 USPQ2d 1321, 1326 (Fed. Cir. 1995) (*en banc*), *aff'd*, 517 U.S. 370 (1996).

Manchak advances several arguments to defend the district court's interpretation of "confined space." First, Manchak notes that dependent claim 5 requires that steam accumulate in the "longitudinally extending space" created by adding depth to the "confined space." Manchak argues that if the "confined space" of claim 1 also confines steam, dependent claim 5 would be superfluous. Under the doctrine of claim differentiation, a claim should not ordinarily be construed in such a manner that would render a related dependent claim superfluous. *See Comark Communications, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187, 48 USPQ2d 1001, 1005 (Fed. Cir. 1998).

As we noted in *Comark*, however, "the doctrine of claim differentiation is not a hard and fast rule of construction." *Id.*, 156 F.3d at 1187, 48 USPQ2d at 1005. Rather, the doctrine is inapplicable where one or more added limitations distinguishes the allegedly superfluous dependent claim from its parent independent claim. *See Mantech Envtl. Corp. v. Hudson Envtl. Servs.*, 152 F.3d 1368, 1376, 47 USPQ2d 1732, 1739 (Fed. Cir. 1998). Here, claims 5, 6, and 7 are distinguishable from claim 1 by their respective additions of a passage and increased depth to create a "longitudinally extending space," blowing step (h), and directing and steam-discharging step (i).

Manchak also advances the well-known principle that "claims are not to be interpreted by adding limitations appearing only in the specification. . . . [A]lthough the specification may well indicate that certain embodiments are preferred, particular embodiments appearing in [the] specification will not be read into the claims when the claim language is broader than such embodiments." *Electro Med. Sys. S.A. v. Cooper Life Sciences*, 34 F.3d 1048, 1054, 32 USPQ2d 1017, 1021 (Fed. Cir. 1994) (citations omitted). Manchak argues that interpreting the "confined space" limitation as also confining steam would improperly incorporate the limitations of the preferred embodiment depicted in Figure 14 into claim 1.

We reject Manchak's characterization of our interpretation as erroneously reading limitations from the written description into the claim. Though columns 8 through 10 and Figure 14 of the '003 patent provide the only support for the method recited in claims 1 and 2, they nowhere describe a "confined space" as confining the reaction product, but not steam. As Sevenson properly notes, accepting Manchak's expansive construction of "confined space" would yield the anomaly of a specification that nowhere describes or depicts a single embodiment illustrating such breadth of interpretation. *See Laitram Corp. v. Morehouse Indus.*, 143 F.3d 1456, 1463, 46 USPQ2d 1609, 1614 (Fed. Cir. 1993) (viewing it as relevant that nothing in the written description suggests the rejected construction). Furthermore, "confined space" is a limitation contained in claim 1, not a feature shown only in the specification. Thus, while the meaning of "confined space" must be gleaned from the claims and the written description, our construction does not import

the term from the specification into claim 1, since it is already there.

III.

Our conclusion that the district court erred in its interpretation of "confined space," and thus in its denial of judgment as a matter of law of no literal infringement, does not end our inquiry. After the verdict, the district court alternatively found that Sevenson had infringed claims 1 and 2 of the '003 patent under the doctrine of equivalents. Though it originally invoked Rule 50(b) for its finding, the district court subsequently re-labeled its finding as arising under Rule 49(a) after realizing that Manchak had not moved for judgment as a matter of law of infringement before the verdict.

Manchak does not dispute the fact that the pugmills used in the Maectite process allow steam to freely escape into the ambient atmosphere. Given our interpretation of "confined space" as requiring a steam-confining top, no reasonable factfinder could find that the pugmills in this case are insubstantially different from the "confined space" of claim 1. *See Sage Prods., Inc. v. Devon Indus., Inc.*, 126 F.3d 1420, 1424, 44 USPQ2d 1103, 1106 (Fed. Cir. 1997). Rather, a limitation — a space that confines both reaction product and steam — is entirely missing in contravention of the All Limitations Rule. *See Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 29-30 (1997); *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 939, 4 USPQ2d 1737, 1743 (Fed. Cir. 1987) (*en banc*). We therefore hold that the Sevenson cannot infringe claims 1 and 2 of the '003 patent under the doctrine of equivalents as a matter of law.

Appendix A

IV.

In light of our holdings that the pugmills used in the Maectite process cannot satisfy the "confined space" limitation of claims 1 and 2 either literally or under the doctrine of equivalents, we need not reach Sevenson's contention that the district court erred in its construction of "initiated" and in invoking Rule 49(a) or that Manchak's representations during the reexamination proceedings warrant remand. Moreover, as we did not consider Manchak's representations before the PTO in construing the "confined space" limitation, we decline Manchak's invitation to sanction Sevenson or dismiss this appeal due to Sevenson's inclusion of references to the reexamination proceedings in its briefs. Finally, the damages judgment naturally falls with our reversal of the infringement findings, as does the award of attorney fees. *See Rodime PLC v. Seagate Tech., Inc.*, 174 F.3d 1294, 1308, 50 USPQ2d 1429, 1439 (Fed. Cir. 1999).

Accordingly, the judgment is in all respects reversed.

APPENDIX B — MEMORANDUM OPINION OF THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF DELAWARE DATED MAY 1, 1997

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

Civil Action No. 95-709-RRM

FRANK MANCHAK, JR.,

Plaintiff,

v.

CHEMICAL WASTE MANAGEMENT, INC., RUST REMEDIAL SERVICES INC., WHEELABRATOR ENVIRONMENTAL SYSTEMS, INC., LAIDLAW ENVIRONMENTAL SERVICES INC., SEVENSON ENVIRONMENTAL SERVICES, INC., and VFL TECHNOLOGY CORPORATION,

Defendants.

MEMORANDUM OPINION

* * *

Dated: May 1, 1997

McKELVIE, District Judge

This is a patent case. Plaintiff Frank Manchak, Jr., a resident of Santa Barbara, California, is the owner of U.S.

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Patent No. 4,079,003 ("the '003 patent"), which is directed toward processes for treating various forms of sludges and converting them into disposable, solid forms. Defendant Sevenson Environmental Services, Inc. is a Delaware corporation with a place of business in Niagara Falls, New York. Defendant Chemical Waste Management, Inc. is a Delaware corporation with a place of business in Oak Brook, Illinois. Defendant Rust Remedial Services Inc. is a Delaware corporation with a place of business in Birmingham, Alabama. Defendant Wheelabrator Environmental Systems Inc. is a Delaware corporation with a place of business in Hampton, New Hampshire. Defendant Laidlaw Environmental Services Inc. is a Delaware corporation with a place of business in Columbia, South Carolina. Defendant VFL Technology Corporation is a Pennsylvania corporation with a place of business in Malvern, Pennsylvania.

1. ***Factual Background and Procedural History***

On November 16, 1995, Manchak filed a complaint in this court alleging that all of the defendants either literally infringed, actively induced the infringement of, or contributed to the infringement of the '003 patent by making, using, or selling processes taught by the '003 patent. Additionally, Manchak alleged that Chemical Waste Management, Inc. willfully infringed the '003 patent. All defendants denied liability and raised an affirmative defense that the '003 patent is invalid. Chemical Waste Management, Inc., Rust Remedial Services Inc., Wheelabrator Environmental Systems Inc., and VFL Technology Corporation raised an affirmative defense that the '003 patent is unenforceable. VFL Technology Corporation and Laidlaw

Environmental Services Inc. counterclaimed for declaratory judgments that they have not infringed the '003 patent and that the '003 patent is invalid and unenforceable.

During a teleconference with the parties on June 17, 1996, the court ordered Manchak to proceed against only one of the defendants. The court reasoned that Manchak would be able to bring the case to trial more expeditiously against one defendant, because he would not be burdened by the demands of taking discovery from the other five defendants. The court also ordered all discovery and other proceedings stayed with respect to the remaining five defendants. Manchak subsequently elected to proceed against Sevenson. Manchak and Sevenson then completed both expert and fact discovery on December 31, 1996.

On January 14-16, 1997, the court presided over a trial on claim construction to resolve the meaning of disputed terms in claims 1 and 13 of the '003 patent. The parties fully briefed claim construction issues prior to the trial. A ten-day jury trial is scheduled to begin on June 9, 1997.

Accordingly, this memorandum opinion constitutes the court's findings on the meaning of the disputed terms in claims 1 and 13 of the '003 patent.

II. *The Technology At Issue and United States Patent No. 4,079,003*

Unless otherwise noted, the following facts are drawn from the prosecution histories of the '003 patent and U.S. Patent No. 4,028,240, a patent owned by Manchak which is directed to sump treatment processes.

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Claims 1 and 13 are apparently the only claims of the '003 patent at issue in this case. Claim 1 is directed to a process for treating "aqueous organic solutions containing sludge" with calcium oxide, which is commonly referred to as limestone or quick lime. Claim 13 is a dependent claim, directed to a process taught by claim 1 in which the "major portion" of the sludge being treated is "of marine origin." As discussed in the specification of the '003 patent, the claimed invention may be used to convert sludges and toxic materials contained within the sludge into a solid form. This solid material can then disposed of easily in landfills or, after being neutralized with acid, used for agricultural purposes. *See* col. 10, lines 3-7.

On October 15, 1973, Manchak applied for a patent directed toward a method for using calcium oxide to neutralize hazardous organic materials in sumps.

Industries and municipal waste facilities often produce waste products containing water-based suspensions of organic and inorganic materials, which are commonly referred to as sludges. These sludges may contain water-soluble toxic metals, such as cadmium, or bacteria and viruses that produce odors.

One method of neutralizing the toxic metals, bacteria, and viruses that may be present in the sludge is through the use of calcium oxide. When calcium oxide is mixed with sludge, it chemically reacts with water present in the sludge. The resulting chemical reaction generates heat. The heat evaporates the water into steam, drying out the sludge. Calcium hydroxide is also formed. The presence of calcium

hydroxide raises the pH of the calcium oxide/sludge mixture to a highly-alkaline level. This rise in alkalinity not only neutralizes any odor-forming bacteria that might be present in the sludge, but also converts toxic metals into insoluble forms. Consequently, the chemical reaction of sludge and calcium oxide produces a solid, dry reaction product that can be safely disposed.

Claims 1-7 of Manchak's application were process claims, reading on treatment procedures in which calcium oxide is used to treat various types of sumps. Claim 1 teaches a five-step process for treating oil field sumps with calcium oxide. Claim 2, a dependent claim, recites a process in which the mixture of oil and calcium oxide specified in claim 1 are dried "in a layer exposed to the atmosphere." Claim 3 teaches a two-step method for treating sewage sumps with calcium oxide. Claim 4-6 recite multi-step processes for treating sumps with calcium oxide. Claim 7 teaches a six-step method of converting liquid or pasty sump contents into soil.

Claims 8-15 were apparatus claims, reading on machines used to transport calcium oxide into the sumps.

On July 15, 1974, the examiner rejected claims 1 and 2 as obvious based on the Liljegren patent in light of the Hess et al patent. The Liljegren patent, U.S. Patent No. 3,476,683, teaches a method of separating inorganic impurities from sewage. The Hess et al. patent, U.S. Patent No. 3,716,474, teaches a method of treating oil in a disposal pit. The examiner concluded that it would be "obvious to apply the process of [Liljegren] to the oil disposal pit [method] of [Hess et al.]."

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Claims 3-6 were rejected as obvious in light of Liljegren. The examiner concluded that considering Liljegren's method of treating sewage, it would be obvious to transport calcium oxide to sump pits containing sewage sludge. Claim 7 was rejected as obvious based on Liljegren in light of the Behringer patent. Behringer, U.S. Patent No. 2,297,195, teaches a method for reducing the alkalinity of certain forms of sewage. The examiner reasoned that it would be obvious to combine Liljegren's treatment method with Behringer's.

On July 15, 1974, Manchak voluntarily withdrew his apparatus claims.

After Manchak subsequently attempted to distinguish over the prior art cited by the examiner, on November 20, 1974, the examiner issued a final rejection of claims 1-7, reaffirming his earlier finding of obviousness.

On February 18, 1975, Manchak appealed the examiner's ruling with respect to claims 1-7 to the Board of Appeals of the United States Patent and Trademark Office. On March 18, 1975, Manchak voluntarily canceled claim 7. On August 8, 1975, Manchak canceled claim 3.

While still awaiting a decision by the Board of Appeals on whether it was proper for the examiner to reject claims 1, 2, 4, 5 and 6 as obvious, Manchak filed a second patent application on June 1, 1976. The second application was filed as a continuation-in-part of Manchak's October 15, 1973 application.

The June 1, 1976 application contained 26 claims. Claims 1-8 were a restatement of the apparatus claims that

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Manchak voluntarily withdrew on July 15, 1974. Claims 20-21 were product claims for the reaction product produced as the result of the calcium oxide/sludge interaction. Claims 22-26 were apparatus claims for an apparatus to transform aqueous sludge into a reaction product.

Claims 9-19 were process claims for treating aqueous sludge with calcium oxide. Claim 9 teaches a seven-step method in which calcium oxide is mixed with the sludge in a confined space. Claims 10-19 are dependent on claim 9. Claim 10 limits the alkalinity of the calcium oxide/sludge mixture to a pH of at least 11. Claim 11 specifies that the alkalinity of the mixture must be high enough to destroy any bacteria or virus present in the sludge. Claim 12 teaches a method in which the reaction of calcium oxide and sludge creates a "hard agglomerated friable solid." Claim 13 teaches that the alkalinity of the mixture must be high enough to turn toxic metals present in the sludge into insoluble compounds. Claims 14-15 add processes for treating steam produced as a result of the sludge/calcium oxide reaction. Claims 16-17 specify methods for decreasing the water content of the sludge. Claim 18 teaches a method of stirring the sludge before it is mixed with calcium oxide. Claim 19 teaches a method in which any odor produced by bacteria present in the sludge is eliminated.

On September 27, 1976, the Board of Appeals reversed the decision of the examiner with respect to claims 1 and 2 of Manchak's original application. These claims subsequently issued as claims 1 and 2 of U.S. Patent No. 4,028,240 on June 7, 1977.

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On December 1, 1976, the examiner of Manchak's continuation-in-part application rejected claims 9-19. Claims 9-15 and 19 were rejected as obvious in light of Liljegren. The examiner determined that it was obvious to modify the process claimed by Liljegren "to carry out lime addition process in elongate space under continuous mixing parameters . . . washing and filtering of steam also obvious." Claims 16 and 17 were rejected as obvious based on Liljegren in combination with Baumann et al. Baumann et al., U.S. Patent No. 3,342,731, apparently teaches a method of using fly ash to reduce the concentration of water in sludge. The examiner reasoned that it was obvious to modify Liljegren's method by adding fly ash. Claim 18 was rejected as obvious based on Liljegren and for lack of definiteness, pursuant to 35 U.S.C. § 112.

On December 1, 1976, Manchak withdrew claims 1-8 and 20-26.

On March 11, 1977, Manchak responded to the examiner's initial action by canceling claims 1-26. In an effort to distinguish his invention over Liljegren and Baumann et al., he added new claims 27-43. Manchak argued in particular that new claim 27 "would not be obvious in view of Liljegren for applicant requires no sedimentation and/or flotation pools nor does he require mechanical dewatering of sludge as required in the Liljegren device."

On June 2, 1977, the examiner rejected claims 27-41 as obvious in light of the claims of the soon-to-be issued '240 patent. On July 20, 1977, Manchak filed a terminal disclaimer with the PTO. The terminal disclaimer specified that "any

patent granted on this application shall be enforceable only for and during such period that said patent is commonly owned with patent no. 4,028,240 . . . ."

On March 14, 1978, U.S. Patent No. 4,079,003 issued. Claims 27-41 issued as claims 1-15 of the '003 patent.

As issued, claim 1 of the '003 patent is directed toward a specific process for treating water-based sludges containing organic materials. It reads as follows:

> 1. A method of transforming aqueous organic material containing sludge that may include virus and odor forming bacteria and toxic soluble compounds that are converted to substantially insoluble compounds in an alkaline environment into a solid, friable, and substantially odor free reaction product, said method comprising the steps of:
>
> > a. sequentially moving said sludge from a source thereof at a first rate;
> >
> > b. sequentially moving calcuim [sic] oxide from a source thereof at a second rate, with said second rate so related to said first rate that when sludge and calcium oxide are mixed an exothermic reaction is initialed [sic] in which said sludge and calcium oxide react with the evolution of steam to form a solid friable, substantially odor free reaction

product that has a pH of at least 12 and in which bacteria and virus initially present in said sludge are deactivated by said pH and the heat of said exothermic reaction, and said soluble toxic compounds initially present in said sludge are transformed to substantially water insoluble compounds due to the high pH of the mixture of said sludge and calcium oxide as they transform to said reaction product;

c. providing an elongate confined space that has first and second ends;

d. directing said sludge and calcium oxide at said first and second rates into said first end of said confined space;

e. concurrently mixing and moving the mixture of said sludge and calcium oxide in said confined space from said first end towards said second end thereof, with the rate of longitudinal movement of said mixture in said confined space being such that said exothermic reaction has transformed said mixture to said reaction product by the time said reaction product has reached said second end;

f. withdrawing said steam from said confined space; and

g. sequentially removing said reaction product from said second end of said confined space.

An example of the sludge treatment process taught by claim 1 is depicted in Figure 14 of the '003 patent's specification. Of the 16 figures depicted by the '003 patent, the parties apparently agree that Figure 14 more closely approximates Sevenson's alleged infringing process than do the other figures.

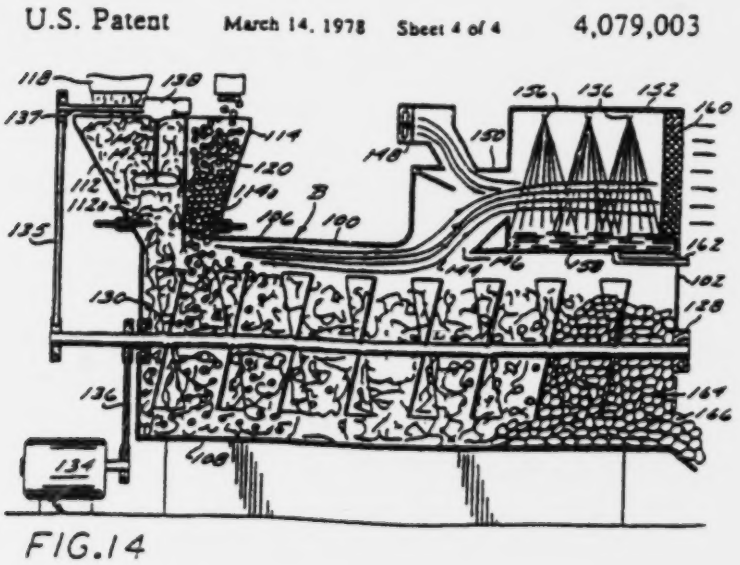

FIG.14

According to the specification of the '003 patent, in Figure 14 sludge is extracted from a disposal site and poured into a hopper that extends outward from an apparatus. Preferably, at least 25% of the sludge (by weight) consists of solid materials. Col. 9, lines 13-15. Calcium oxide, which is commonly known as limestone or quick lime, is poured

down a second hopper that also extends outward from the apparatus. The sludge and calcium oxide are then directed into a "confined space" at sequentially ordered rates in order to facilitate a chemical reaction. Col. 9, lines 25-27.

Upon being directed into the confined space of the apparatus, the sludge and calcium oxide react chemically in the manner described above. As the sludge becomes dehydrated by the evaporation of liquid water into steam, it is transformed into an "agglomerated, solid [and] friable" (col. 9, line 45) substance that, after being moved out of the elongate confined space where the reaction takes place, can (among other things) be disposed of in a landfill or neutralized with acid for use in agricultural operations.

The production of calcium hydroxide raises the pH of the initial sludge/calcium oxide mixture to at least 12.4. At that pH level, odor-forming bacteria or viruses present in the sludge are "destroy[ed]" (col. 9, line 41) and any toxic metals present in sludge are converted into insoluble forms. The heat produced by the reaction of water and calcium oxide also contributes to the destruction of bacteria and virus that may be present in the sludge.

Steam produced as the result of the reaction between the water in the sludge and the calcium oxide is propelled by a fan up a chute in the apparatus. The steam, which presumably contains some solid particles at that point, is treated with a fine water spray, moves through a filter, and then exits the apparatus into the surrounding environment. Col. 9, lines 3-6.

Appendix B

III. *Discussion*

A. *Claims of the '003 Patent that the Court Will Construe*

Claim 1 of the '003 patent is an independent claim directed to a seven-step sludge treatment process that is a somewhat simplified version of the embodiment that is depicted in Figure 14 (which appears to be an apparatus constructed along the lines of the teachings of claims 1, 2, 5, 6, 7, and 9). Only four of the treatment steps appear to be at issue in this case. These steps are as follows:

> 1. A method of transforming aqueous organic material containing sludge that may include virus and odor forming bacteria and toxic soluble compounds that are converted to substantially insoluble compounds in an alkaline environment into a solid, friable, and substantially odor free reaction product, said method comprising the steps of:
>
> . . .
>
> b. sequentially moving calcuim [sic] oxide from a source thereof at a second rate, with said second rate so related to said first rate that when sludge and calcium oxide are mixed an exothermic reaction is initialed [sic] in which said sludge and calcium oxide react with the evolution of steam to form a solid,

> friable, substantially odor free reaction product that has a pH of at least 12 and in which bacteria and virus initially present in said sludge are deactivated by said pH and the heat of said exothermic reaction, and said soluble toxic compounds initially present in said sludge are transformed to substantially water insoluble compounds due to the high pH of the mixture of said sludge and calcium oxide as they transform to said reaction product;
>
> c. providing an elongate confined space that has first and second ends; [and]
>
> . . .
>
> f. withdrawing said steam from said confined space . . . .

Dependent claim 13 has the required elements of claim 1 and the additional requirement that the "major portion" of the sludge be of "marine origin." It reads as follows:

> The method as defined in claim 1 in which the major portion of said sludge is of marine origin.

On January 14-16, 1997, the court presided over a trial concerning the construction of claims 1 and 13 of the '003 patent. The court heard argument from the parties and testimony from the following individuals: Rene D.

Tegtmeyer, a former patent examiner at the United States Patent and Trademark Office, who has been retained by Sevenson as its patent law expert; Dr. G. Lee Christensen, Sevenson's technical expert, who is the Edward A. Daylor Professor of Environmental Engineering at Villanova University in Villanova, Pennsylvania; and Dr. Ronald D. Neufeld, plaintiff's technical expert, who is a Professor of Civil Engineering at the University of Pittsburgh in Pittsburgh, Pennsylvania.

B. *Claim Construction*

Claim construction is a matter for the court. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), *aff'd*, 116 S. Ct. 1384 (1996). A court undertakes the task of claim construction only if the parties raise a genuine dispute about the meaning of claim terms. *See United States Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997); *see also Elf Atochem North Am., Inc. v. Libbey-Owens-Ford Co.*, 894 F. Supp. 844, 858 (D. Del. 1995).

In construing patent claims, a court must first evaluate the claims of the particular patent, both those that are asserted in the litigation and those that are unasserted; the patent's specification; and the patent's prosecution history. If the terms of the claims are not defined by the patent holder in either the patent's specification or its prosecution history, then the court must define the terms according to their ordinary meaning. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). In determining the terms' ordinary meaning, the court may consult both general and

technical dictionaries to aid it in its construction efforts. *See id* at 1584 n.6; *Athletic Alternatives, Inc. v. Prince Mfg., Inc.*, 73 F.3d 1573, 1578 (Fed. Cir. 1996) (employing definitions from a general dictionary to construe claim terms); *Quantum Corp. v. Rodime, PLC*, 65 F.3d 1577, 1581 (Fed. Cir. 1995) ("[W]e see no error in the district court's use of dictionary definitions to ascertain the ordinary meaning of the relevant claim limitation."), *cert. denied*, 116 S. Ct. 1567 (1996). In construing the terms of a claim, moreover, a court may use established canons of claim construction, such as the doctrine of claim differentiation. *Athletic Alternatives, Inc.*, 73 F.3d at 1578.

If the court's analysis of the intrinsic evidence — the claim terms themselves, the patent's specification, and the prosecution history — fails to yield any conclusive construction results, the court may then consult extrinsic evidence, such as expert testimony and prior art, to aid it in its construction efforts. *Vitronics*, 90 F.3d at 1584. Extrinsic evidence may also be considered if needed to assist the court in understanding the technology at issue or in determining the meaning or scope of technical terms in a claim. *See Hoechst Celanese Corp. v. BP Chemicals Ltd.*, 78 F.3d 1575, 1579 (Fed. Cir.), *cert. denied*, 117 S. Ct. 275 (1996).

1. ***What were the skills and qualifications of individuals with ordinary skill in the art of sludge treatment in 1976?***

Before construing the genuinely disputed terms of claims 1 and 13 of the '003 patent, the court must, as a threshold matter, determine the requisite educational level and work

experience for one with ordinary skill in the art taught by the '003 patent. The parties agree that the art in question is the treatment of sludge.

To determine what constitutes the ordinary skill in an art, the court considers several factors, including: " '[the] type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations [in the art] are made; sophistication of the technology; and educational level of active workers in the field.' " *In re GPAC Inc.*, 57 F.3d 1573, 1578 (Fed. Cir. 1995) (quoting *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986)).

Dr. G. Lee Christensen, Sevenson's technical expert, who is the Edward A. Daylor Professor of Environmental Engineering at Villanova University, testified on direct examination that one with ordinary skill in the art of sludge treatment in 1976 would be "somebody with a Master's degree in environmental engineering, with probably five years of experience [in the treatment of sludge and] is the kind of person who would be making decisions and discoveries and innovations connected with sludge processing disposal in 1976."

Dr. Ronald D. Neufeld, Manchak's technical expert, who is a Professor of Civil Engineering at the University of Pittsburgh, presented a much different description of one with ordinary skill in the art of sludge treatment in 1976. Such an individual, Dr. Neufeld testified, would be employed as a project manager by an environmental remediation company. Dr. Neufeld testified on direct examination that after

considering the limited formal educational level of both workers in the art and the patent's inventor (who does not have any formal education beyond the seventh grade), the low level of sophistication of sludge treatment technology, and the slow advancement in the sludge treatment field, he would describe the level of ordinary skill in the art in 1976 as follows:

> I believe a person [of ordinary skill in the art] should have a skill of an experience in understanding the nature of the sludge-handling problem. That person has to have a skill to be able to obtain information that may be beyond his formal education. That person has to have [ ] an inquisitive mind and the ability to learn.

Dr. Neufeld emphasized during his direct examination that it would not be necessary for one with ordinary skill in the art of sludge treatment in 1976 to have had any formal education beyond high school. Additionally, Dr. Neufeld testified that a project manager with ordinary skill in the art would not need to have worked for a minimum number of years in the industry in order to reach the level of one with ordinary skill in the art.

After evaluating the testimonies of Drs. Christensen and Neufeld, the court finds that Dr. Neufeld's definition of one with ordinary skill in the art of sludge treatment in 1976 is more appropriate for the following reasons. First, Dr. Christensen's definition would create an anomalous result: the classification of Manchak, an individual who does have any formal education beyond the seventh grade, as one who

does not have ordinary skill in the art. *See, e.g., Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991) (stating that the district court could consider the educational level of the inventor probative for the purpose of determining the level of ordinary skill in the art); *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 448 (Fed. Cir. 1986) ("Inventors, as a class, according to the concepts underlying the Constitution and the statutes that have created the patent system, possess something — call it what you will — which sets them apart from the workers of ordinary skill . . . ."), *cert. denied*, 484 U.S. 823 (1987).

Second, Dr. Neufeld testified that he evaluated several of the factors considered relevant in a court's determination of the level of ordinary skill in an art — including the low level of sophistication of sludge treatment technology and the slow technological advances in this art — in formulating his definition. Third, Dr. Neufeld's approach toward determining the ordinary skill in the art is more focused on examining the skill level of project managers — as opposed to Dr. Christensen's focus on those experts who are concerned primarily with academic studies of sludge treatment processes.

The court does not accept, however, Dr. Neufeld's suggestion that an individual need not have worked a minimum number of years in the sludge treatment industry to attain the level of one with ordinary skill in the art. While the court can imagine a hypothetical worker with enough industriousness to achieve an ordinary skill level straight out of high school, the court finds that sludge removal projects are sufficiently complicated such that a typical

worker in this field will require some experience before he or she can begin to master the art of designing sludge treatment processes.

Accordingly, the court will adopt the following definition of one with ordinary skill in the art of sludge treatment in 1976:

> A sludge removal project supervisor, who has worked at least two years in the industry and remains continually abreast of practical innovations and technological developments in the art of sludge treatment.

Having set out the level of ordinary skill in the art of sludge treatment in 1976, the court will now endeavor to construe the genuinely disputed terms of claims 1 and 13 of the '003 patent.

2. *The court's construction of genuinely disputed terms of the '003 patent*

a. *The construction of the phrase "aqueous organic material containing sludge"*

The phrase "aqueous organic material containing sludge" appears in the preamble of claim 1 of the '003 patent, prior to the claim's recitation of its seven required treatment steps. The court notes that based on the testimony of the parties' experts, there does not appear to be a genuine dispute about the meaning of the terms "aqueous" and "organic material."

There may, however, be a genuine dispute as to the meaning of the term "sludge." Sevenson first argues that the term, as used in the context of the phrase "aqueous organic material containing sludge" in claim 1 of the '003 patent is indefinite under 35 U.S.C. § 112 and also constitutes impermissible new matter because it was used for the first time in Manchak's March 1, 1977 amendment to his continuation-in-part application. Second, Sevenson argues that the construction of "sludge" should be limited as follows: "The term sludge is limited to materials that when mixed with other non-sludge materials forms a mixture containing more than fifty percent sludge by weight." Sevenson does not specify the basis for such a construction. Third, Sevenson appears to suggest that the term should be construed according to claim 9 of Manchak's continued application (prior to amendment), which read: "A method of transforming aqueous sludge of industrial, municipal or marine origin . . . ." Sevenson apparently finds support for such a limitation in the specification of the '003 patent. *See* col. 9, lines 20-24 (describing sludge from an "industrial or municipal origin").

Manchak counters by arguing that "sludge" should be construed according to its ordinary meaning, because it is not defined explicitly in the '003 patent or its prosecution history.

As for Sevenson's first argument that the phrase "aqueous organic material containing sludge" is indefinite and constitutes impermissible new matter, the court finds that it is improper to consider these defenses within the context of claim construction. *See Intervet Am. v. Kee-Vat Labs., Inc.*, 887 F.2d 1050, 1053 (Fed. Cir. 1989).

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Sevenson's second argument, that "sludge" must be defined so as to require the "aqueous organic solution" to contain fifty-percent sludge by weight, is not supported by the specification of the '003 patent. The specification's description of the embodiment depicted in Figure 14 is the only reference in the '003 patent to any requirement that "sludge" must constitute a minimum percentage of the aqueous organic solution: "The sludge to be transformed to a reaction product preferably has a water content of not over 75 percent (75%) by weight." Col. 9, lines 13-15. It is established, however, that a patent's preferred embodiment should not be construed to limit the scope of the patent's claims. *See Laitram Corp. v. Cambridge Wire Cloth Co.*, 863 F.2d 855, 865 (Fed. Cir. 1988), *cert. denied*, 490 U.S. 1068 (1989). And even if the court were to find the description of sludge in the '003 patent's embodiment instructive for the purpose of claim construction, the court notes that the water-content limitation expressed in the embodiment is described as being a *preferable* water content, not an absolute restriction.

Sevenson's third argument — that the sludge must be of "industrial, municipal or marine origin" — is unsupported by the specification of the patent. The specification notes that the sludge "may have an industrial or municipal origin," (col. 9, lines 21-22) but does not limit the sludge's origin to those sources.

Thus, the term "sludge" is not explicitly defined in the specification of the '003 patent or its prosecution history. However, the court heard testimony from Manchak's technical expert that "sludge" has special technical

significance to one with ordinary skill in the art of sludge treatment. Dr. Neufeld testified on direct examination that the term "sludge" has special technical significance to one with ordinary skill in the art of sludge treatment. Dr. Christensen did not appear to dispute Dr. Neufeld's testimony. Therefore, the court will consider extrinsic evidence to determine the term's ordinary meaning.

Dr. Neufeld further testified on direct examination that an individual with ordinary skill in the art of sludge treatment in 1976 would consider the PTO's Class 210 definition of "sludge" to be an acceptable definition of that term.[1] The PTO defines "sludge" as follows:

> Concentrate of settled colloidal suspension with a mushy or mud texture, a gel (with up to more than 90 percent usually water) but quite viscous. It may contain indiscriminate soils as grits, fiber, wood chip, and emulsions. While still wet, treatment is proper for this class, but the same material when completely dry may be referred to as sludge.

---

1. For the purpose of conducting prior art searches, the PTO "classifies the subject matter of inventions into over 400 different classes of art, which are divided into over 100,000 subclasses." Arthur L. Plevy, *How to Obtain Patents, Trademarks and Copyrights*, 161-JUN NJLAW 12, 13 (1994); *see also* 2 DONALD S. CHISUM, PATENTS § 5.03[1][a][iii] (1996).

The PTO publishes definitions pertaining to each class of art in classification manuals. Plevy, 161-JUN NJLAW at 13. Class 210 was adopted by the PTO in 1957, and can be found on the PTO's web site at the following address: <http://patents.cnid...ses/us/210/210.html>.

The court further notes that Dr. Christensen, on cross examination, agreed that this definition would generally be acceptable to him. The court therefore adopts the PTO Class 210 definition of "sludge" as the ordinary meaning of the term.

Accordingly, the court will construe the term " sludge" as follows:

> Sludge is a concentrate of settled colloidal suspension with a mushy or mud texture, a gel (with up to more than 90 percent usually water) but quite viscous. It may contain indiscriminate soils as grits, fiber, wood chip and emulsions.

b. ***The construction of the phrase "substantially insoluble compounds"***

The phrase "substantially insoluble compounds" appears in the preamble to claim 1, prior to the claim's recitation of its seven required sludge treatment steps. The court notes that there does not appear to be a genuine dispute between the parties as to the meaning of the terms "substantially" and "compounds."

Manchak argues that the term "insoluble" can be construed according to its ordinary meaning as defined by a general dictionary, because it is not explicitly defined in the '003 patent or its prosecution history.

However, Sevenson makes two arguments against this proposed construction. First, Sevenson argues, contrary to

the plain language of the term, that it should "not cover substantially water insoluble compounds." Sevenson does not specify the basis for such a construction. Second, Sevenson argues that the term "should not cover a process" that would make the compounds insoluble in certain acids. As support for its second argument, Sevenson cites to testimony from Dr. Christensen. Dr. Christensen testified on direct examination that it does not follow from the phrase "substantially insoluble" that such a compound would be soluble in both water and acid.

After evaluating the specification of the '003 patent and its prosecution history, the court finds that the term "insoluble" is not specifically defined. However, because the '003 patent is apparently directed to processes designed to transform toxic compounds into forms that will not pollute water, the court finds that the solubility of the "compounds" should be measured according to their ability to dissolve in water. Additionally, the court notes that claim 1(b) explicitly uses the term "water insoluble compounds."

Thus, the court will construe the term "insoluble" according to its ordinary meaning. "Soluble" is defined by *Webster's Third New International Dictionary* 2190 (1986) as "susceptible of being dissolved in or as if in a fluid."

Consequently, the court's construction of the phrase "insoluble" is as follows:

Unable to be dissolved in water.

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c. *The construction of the phrase "a solid, friable, and substantially odor free reaction product"*

The phrase "a solid, friable, and substantially odor free reaction product" also appears in the preamble to claim 1 of the '003 patent, prior to the claim's recitation of its seven required sludge treatment steps, and it modifies the term "reaction product." The parties do not dispute the meaning of the terms "solid," "substantially odor free," and "reaction product."

As for the term "friable," Sevenson argues that this term must be construed so as to require that the reaction product be dry. To support its proposed construction, it cites to the specification of U.S. Patent No. 141,848, which was issued to Albert F. Andrews on March 19, 1873. *See* Andrews, col. 2, lines 14-16 (describing the treated material as being "reduced to a dry condition"). Manchak argues that the term should be construed according to its ordinary meaning, because it is not otherwise defined in the '003 patent or its prosecution history.

To the extent that Sevenson is suggesting that the reaction product must be completely free of water, this construction is not supported by a description of the reaction product in the "Description of the Prior Art" section of the '003 patent's background section: "The reaction product retains a substantial quantity of initially present water as an integral part thereof." Col. 1, lines 58-60. Accordingly, the court will not adopt Sevenson's proposed limitation and will instead construe the term according to its ordinary meaning,

because the term is not specifically defined in the patent's specification or prosecution history.

"Friable" is defined by *Webster's Third New International Dictionary* 910 (1986) as follows: "[E]asily crumbled, pulverized, or reduced to powder." The court will adopt this definition of "friable" the ordinary meaning of the term.

Consequently, the court will construe the term "friable" to mean:

> Easily crumbled, pulverized, or reduced to powder.

d. *The construction of the term "inita[t]ed"*

The term "initialed" appears in part (b) of claim 1 of the '003 patent and is a required element within the second step of the seven-step sludge treatment process taught by claim 1. The court notes that the parties agree that this term, as it appears in claim 1, is a typographical error and should be read as "initiated."

The parties appear to agree that the term "initiated" should be construed to mean "commenced." However, they disagree as to when the reaction between calcium oxide and the water in the sludge should be "initiated." Sevenson argues that the initiation of the reaction must take place inside of the "elongate confined space" of the treatment apparatus. *See* col. 9, lines 25-30 (stating that sludge and calcium oxide "are brought into physical contact in the rearward portion of the confined space").

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Manchak argues that the term should be construed according to its ordinary meaning, because it is not explicitly defined in the specification of the '003 patent or its prosecution history. He does not appear to directly dispute Sevenson's proposed construction.

Claim 1(b), in which the term "initiated" appears, does not specify where the reaction between calcium oxide and the water in the sludge begins. However, claim 1(d) specifies that sludge and calcium oxide (not a mixture of the two) are "direct[ed]" into the first end of the elongate confined space. Claim 1(d) therefore appears to teach that the sludge and calcium oxide are not mixed together until they reach the first end of the elongate confined space. The court also finds support for such a construction in claim 1(e), which specifies that the "mixing" of sludge and calcium oxide occurs in the "said confined space."

Consequently, the court will construe the term "initiated" as follows:

> Commenced in the first end of the elongate confined space.

e. *The construction of the phrase "pH of at least 12"*

The phrase "pH of at least 12" appears in claim 1(b) of the '003 patent and is a limitation on the level of acidity of the reaction product produced as the result of mixing together sludge and calcium oxide.

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Sevenson argues that the term should be read as "pH of at least 12.4" because the embodiment of the '003 patent depicted in Figure 14 refers to the pH of the reaction product as being at least 12.4. *See* col. 9, line 39. Sevenson also argues that there is no basis in Manchak's June 1, 1976 application for the limitation "pH of at least 12" to appear in claim 1(b). It claims that the limitation is impermissible new matter, because Manchak first added the phrase to his continuation-in-part application on March 1, 1977 (the date of Manchak's amendment).

Manchak argues that the term should be construed according to its ordinary meaning, because it is not explicitly defined in the specification of the '003 patent or its prosecution history.

As stated above, it is established that a patent's preferred embodiment should not be read to limit the scope of the patent's claims. *See Laitram Corp. v. Cambridge Wire Cloth Co.*, 863 F.2d 855, 865 (Fed. Cir. 1988), *cert. denied*, 490 U.S. 1068 (1989). Accordingly, even though the preferred embodiment and the patent's abstract specify a minimum pH of 12.4, the court will not adopt Sevenson's construction because it runs counter to the clear language of claim 1(b). And, as is also stated above, the court finds that it is not appropriate for Sevenson to raise a new matter defense in the claim construction context. *See Intervet Am. v. Kee-Vat Labs., Inc.*, 887 F.2d 1050, 1053 (Fed. Cir. 1989).

Consequently, the court will construe the phrase "pH of at least 12" to mean "pH of at least 12."

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f. *The construction of the phrase "bacteria and virus initially present in said sludge are deactivated"*

The phrase "bacteria and virus initially present in said sludge are deactivated" appears in claim 1(b) of the '003 patent and is a required element within the second step of the seven-step sludge treatment process taught by claim 1.

As it argued with respect to the term "pH of at least 12," Sevenson argues that the term "deactivated" must be read as "destroyed" because the term "deactivated" does not appear in the patent's specification or prosecution history. It notes, however, that the term "destroyed" appears in the specification. *See*, *e.g.*, col. 1, lines 43-49. Sevenson also argues that there is no basis in Manchak's June 1, 1976 continuation-in-part application for claiming that the bacteria in the virus in the sludge are "deactivated." As with its argument with respect to the phrase "pH of at least 12," Sevenson argues that the term "deactivated" is impermissible new matter, because it first appeared in Manchak's March 1, 1977 amendment.

For the reasons stated above with respect to the court's construction of the term "pH of at least 12," the court will not adopt Sevenson's proposed construction. And because the term "deactivated" is not explicitly defined in the specification or prosecution history of the '003 patent, the court will construe the term according to its ordinary meaning.

Webster's Third New International Dictionary 59 (1986) defines the verb "deactivate" as follows: "to make inactive

or ineffective." Consequently, the court will adopt the following construction of the phrase "bacteria and virus initially present in said sludge are deactivated":

> Bacteria and virus initially present in said sludge are made inactive or ineffective.

g. *The construction of the phrases "elongate confined space" and "withdrawing said steam from said confined space"*

The phrase "elongate confined space" appears in claim 1(c) of the '003 patent and is the third step of the seven-step sludge treatment process taught by claim 1. The phrase "withdrawing said steam from said confined space" appears in claim 1(f) of the '003 patent and is the sixth step of the seven-step sludge treatment process taught by claim 1.

The parties do not dispute the construction of the terms "elongate," "space," and "steam." They do, however, dispute the meaning of the terms "confined" and "withdrawing."

Sevenson argues that "confined" should be construed so as to require that the apparatus embodied in claim 1 of the '003 patent must contain steam produced by the reaction between calcium oxide and water in the sludge that occurs within the elongate confined space. In essence, Sevenson argues that the apparatus must have a top or some other structure that will prevent the steam from escaping from the elongate confined space into the ambient environment. In support of its construction, Sevenson cites to references to the phrase "elongate confined space" in the specification of

the '003 patent (*see, e.g.*, col. 8, lines 20-22); and testimony from Dr. Christensen that he reads claim 1 of the '003 patent to require some type of top.

As for the term "withdrawing," Sevenson argues that this term should be construed so as to require that steam must be actively removed from the elongate confined space — rather than being allowed to escape passively into the ambient environment. In support of its construction, Sevenson cites to a reference to steam in the embodiment depicted by Figure 14 of the '003 patent (*see* col. 8, lines 61-64) and testimony from Dr. Christensen that he considers the word "withdraw" to connote an active means of withdrawing steam.

Conversely, Manchak argues that claim 1 of the '003 patent does not contain any limitation requiring that steam be confined within the elongate confined space. He argues that because claims 5, 6, and 7 of the '003 patent all teach processes in which steam must be confined within an apparatus before subsequently being released into the ambient environment, claim 1 must, according to the doctrine of claim differentiation, be read so as to have it claim inventions different from those claimed in claims 5, 6, and 7. Manchak also argues that allowing steam to accumulate within the elongate confined space would defeat the purpose of the claimed invention, as it could potentially create dangerous conditions resulting from the pressurized conditions in the elongate confined space. Dr. Neufeld testified on direct examination that the accumulation of steam in such a confined space could be dangerous.

Appendix B

As for his proposed construction of "withdrawing," Manchak argues that claim 1 does not require that the steam be actively removed from the elongate confined space. Noting that claim 6 reads on a process in which steam is actively withdrawn from the apparatus, he again cites to the doctrine of claim differentiation. He argues, therefore, that construing claim 1 to require an active means of steam withdrawal would make claim 6 impermissibly redundant. For additional support for his proposed construction, Manchak cites to testimony from Dr. Neufeld that confining steam in the elongate confined space would prevent the formation of a dry reaction product.

Sevenson responds to Manchak's claim differentiation analysis by arguing that claim 5 claims an invention that allows a greater quantity of steam to accumulate (through the increased depth of its "longitudinally extending space") than does claim 1. Accordingly, it argues, claims 1 and 5 can be construed so as to embody different inventions. It is unclear as to the basis of Sevenson's argument.

At the outset, the court notes that it will not consider Sevenson's cites to descriptions of the embodiment depicted in Figure 14 of the '003 patent as support for Sevenson's proposed construction of the terms "confined" and "withdrawing." *See, e.g.*, col. 8, lines 61-64. Drawing on the plain language of the specification, the court finds that Figure 14 depicts an apparatus embodied by claims 1, 5, 6, 7, and 9 of the '003 patent. That is, Figure 14 embodies the seven-step process claimed in claim 1, and adds the additional steps of allowing steam to accumulate (claim 5), blowing the steam outside of the area in which it is allowed

to accumulate (claim 6), treating the steam with water (claim 7), and filtering the steam before it is actively discharged into the ambient environment (claim 9). Accordingly, because the embodiment depicted in Figure 14 teaches an invention with more limitations than are taught by claim 1, any citations by Sevenson to descriptions of the embodiment depicted in Figure 14 as support for its proposed construction of the terms "confined" and "withdrawing" are contrary to the principle that a patent's preferred embodiment should not be construed so as to limit the scope of the patent's claims.

The doctrine of claim differentiation states that " 'claims should be presumed to cover different inventions.' " *Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 1538 (Fed. Cir. 1991) (quoting *Autogiro Co. of Am. v. United States*, 384 F.2d 391, 404 (Ct. Cl. 1967)). Claim differentiation also embodies the principle that the narrow limitations of one claim should not be read into a broader, more general claim. *D.M.I. Inc. v. Deere & Co.*, 755 F.2d 1570, 1574 (Fed. Cir. 1985).

In this case, Sevenson's argument that claim 1(c) of the '003 patent should be construed so as to require a means by which steam can accumulate does not comport with the doctrine of claim differentiation. In essence, Sevenson seeks to read a limitation of claim 5 — the accumulation of steam within a "longitudinally extending confined space" — into the general language of claim 1, which does not read in any way on a process for allowing steam to accumulate in the elongate space. And because claim 1 does not read on any process that allows steam to accumulate, Sevenson's argument that claim 5 simply allows for a larger space for

steam accumulation than the inventions claimed by claim 1 does not comport with the doctrine of claim differentiation.

Accordingly, the court will construe the phrase "elongate confined space" as follows:

> An elongate space that must confine the reaction product of calcium oxide and sludge. However, steam produced as the result of the reaction between calcium oxide and water in the sludge need not be so confined.

Additionally, the court agrees with Manchak's argument that the canon of claim differentiation precludes reading claim 1(f) to require that steam must be actively "withdrawn" from the elongate confined space. Claim 5 adds onto the seven-step process taught by claim 1 by providing for a "longitudinally extending space . . . into which said steam can accumulate . . . ." And claim 6 of the '003 patent adds a ninth step to claim 5. The ninth step, step (h), reads as follows:

> [B]lowing a stream of air across said passage and substantially normal thereto to withdraw said steam from said longitudinally extending space.

So Sevenson's argument that the phrase "withdrawing steam" should be construed to require an active means of removing steam from the elongate confined space would impermissibly narrow the scope of claim 1 by reading in claim 6's active-withdrawal-of-steam limitation into claim 1.

Accordingly, the court will construe the phrase "withdrawing said steam from said confined space" as follows:

Removing, either by active or passive means, steam from the elongate confined space.

h. *The construction of the phrase "major portion of said sludge is of marine origin"*

The final construction that the court must undertake is the phrase "major portion of said sludge is of marine origin," which appears in dependent claim 13. Claim 13 reads: "The method as defined in claim 1 in which the major portion of said sludge is of marine origin."

Sevenson argues that the term should be construed to require that more than 50 percent of the sludge by weight originates in salt water. It apparently relies on the term's ordinary meaning as support for its construction. Manchak argues that the phrase should be construed according to its ordinary meaning, because it is not otherwise defined in the '003 patent or its prosecution history.

The court finds that because the terms "major portion" and "marine" are not specifically defined in the specification and prosecution history of the '003 patent, the court will construe the terms according to their ordinary meaning.

Webster's Third New International Dictionary, 1382 (1986) defines "marine" as of or relating to the sea." The word "sea" is defined as "the oceans of the world with their dependent saline waters." *Id.* at 2045. The word "major" is defined as "greater in number, quantity, or extent." *Id.* at 1363. Accordingly, given the ordinary meanings of these terms, the court will adopt most of Sevenson's proposed

construction. The court's construction of the phrase "major portion of said sludge is of marine origin" is as follows:

> More than 50 percent of the said sludge by weight is taken from the ocean or its dependent saline waters.

IV. *Conclusion*

Having construed the genuinely disputed terms in claims 1 and 13 of U.S. Patent No. 4,079,003 in the manner set forth above, should this case proceed to trial, the court will instruct the jury in accordance with this memorandum opinion.

APPENDIX C — ORDER OF THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT DENYING PETITION FOR REHEARING DATED AND FILED FEBRUARY 8, 2000

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

98-1530

FRANK MANCHAK, JR.,

Plaintiff-Appellee,

v.

CHEMICAL WASTE MANAGEMENT, INC., RUST REMEDIAL SERVICES, INC., WHEELABRATOR ENVIRONMENTAL SYSTEMS, INC., and LAIDLAW ENVIRONMENTAL SERVICES, INC.,

Defendants,

and

SEVENSON ENVIRONMENTAL SERVICES, INC.,

Defendant-Appellant.

ORDER

A combined petition for rehearing and petition for rehearing en banc having been filed by the APPELLEE, and a response thereto having been invited by the court and filed

by the APPELLANT, and the petition for rehearing having been referred to the panel that heard the appeal, and thereafter the petition for rehearing en banc and response having been referred to the circuit judges who are in regular active service,

UPON CONSIDERATION THEREOF, it is

ORDERED that the petition for rehearing be, and the same hereby is, DENIED and it is further

ORDERED that the petition for rehearing en banc be, and the same hereby is, DECLINED.

The mandate of the court will issue on February 15, 2000.

FOR THE COURT,

s/ Jan Horbaly (AV)
Jan Horbaly
Clerk

Dated: February 8, 2000

APPENDIX D — CONSTITUTIONAL PROVISION AND RULE INVOLVED

U.S. Const., art. I, § 8, cl. 8

To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries;

* * *

Fed. R. Civ. P. 52(a)

Rule 52. Findings by the Court; Judgment on Partial Findings

(a) Effect. In all actions tried upon the facts without a jury or with an advisory jury, the court shall find the facts specially and state separately its conclusions of law thereon, and judgment shall be entered pursuant to Rule 58; and in granting or refusing interlocutory injunctions the court shall similarly set forth the findings of fact and conclusions of law which constitute the grounds of its action. Requests for findings are not necessary for purposes of review. Findings of fact, whether based on oral or documentary evidence, shall not be set aside unless clearly erroneous, and due regard shall be given to the opportunity of the trial court to judge of the credibility of the witnesses. The findings of a master, to the extent that the court adopts them, shall be considered as the findings of the court. It will be sufficient if the findings of fact and conclusions of law are stated orally and recorded in open court following the close of the evidence or appear in an opinion or memorandum of decision filed by the court. Findings of fact and conclusions of law are unnecessary on decisions of motions under Rule 12 or 56 or any other motion except as provided in subdivision (c) of this rule.

* * * *

APPENDIX E — U.S. PATENT NO. 4,028,240 DATED JUNE 7, 1977

[Omitted here but submitted separately as Lodging Appendix]

APPENDIX F — U.S. PATENT NO. 4,079,003 DATED MARCH 14, 1978

[Omitted here but submitted separately as Lodging Appendix]

APPENDIX G — ARTICLE FROM AMERICAN BAR ASSOCIATION, *THE FEDERAL CIRCUIT'S DE NOVO REVIEW OF PATENT CLAIM CONSTRUCTION: A NEED FOR A MORE BALANCED APPROACH*, FALL 1999

[Omitted here but submitted separately as Lodging Appendix]